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PHOTOGRAPHIC SYSTEM FOR ENABLING INTERACTIVE
COMMUNICATION BETWEEN A CAMERA AND AN ATTRACTION
SITE

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**PHOTOGRAPHIC SYSTEM FOR ENABLING INTERACTIVE
COMMUNICATION BETWEEN A CAMERA AND AN ATTRACTION
SITE**

5 **CROSS REFERENCE TO RELATED APPLICATIONS**

This is a continuation of application Serial No. 08/977,383, filed
November 24, 1997.

FIELD OF THE INVENTION

10 The invention relates generally to the field of photography, and in
particular to a photographic system including a camera that is capable of
interactive data communication with sources of digital data associated with one or
more scenes.

BACKGROUND OF THE INVENTION

15 It is known in the art that a film or an electronic camera can record
image information on either a film or store the information in electronic memory.
It is also known in the art that a wireless transceiver can be used to transmit and
receive data. An example of such a device is shown in U.S. patent number
4,957,348. Digital cameras also have the capability of storing additional
20 information along with the image. An example of a digital camera with such
capability is the Kodak DCS 460 Digital Camera, which is capable of storing
voice annotation and Global Positioning System (GPS) parameters along with the
digital image. Moreover, the film used by the Advanced Photo System™, sold by
Eastman Kodak Company and referred to as Advantix™ film, allows a camera to
25 store digital information on a clear magnetic layer on the back of the photographic
film. This feature is disclosed in U.S. patent number 5,194,892.

U.S. patent number 5,296,884 discloses a camera that can receive
location coordinates, such as GPS signals, from a wireless source, and then
convert that information to a location name such as a name of a city. The city
30 name is then printed on the photograph after it has been processed. U.S. patent
number 5,479,228 discloses a camera system with memory that can store a set of
optional phrases such as "Happy New Year" and "Happy Birthday" which can be
stored on the magnetic layer of Advantix™ film and printed on the photograph
during the processing operation.

35 Serial No. 08/707,265, entitled "Tradeshow Photographic and Data
Transmission System", and filed on October 15, 1996 in the names of the same
inventors and the same assignee as the present application, discloses a
photographic and data transmission system including two main parts. The first

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The present invention is directed to overcoming one or more of the problems set forth above. Briefly summarized, according to one aspect of the present invention, a photographic system involves the collection of data from a scene, e.g., an visitor attraction site, that is capable of interactive communication with a user. The attraction site stores content data related to the site, and the user communicates with the attraction site through a camera capable of communication with the site. Besides capturing an image associated with the site, the camera stores predetermined personality data that relates an interest of the user to at least a portion of the content data and includes means for transferring the personality data to the attraction site. The camera further includes means for receiving and displaying the portion of the content data from the attraction site, and a user interface for selecting from the displayed content data that part which the user wants to keep.

In a further embodiment, the user of a camera interactively communicates with one or more attraction sites linked to a server and defining therewith a site/server subsystem. The site/server subsystem comprises means for storing content data related to the site, usually resident on the server, and communication means, usually resident at the attraction site, for receiving communications from the camera and for transferring the content data to the camera. Besides capturing an image associated with the site, the camera includes means for storing predetermined personality data that relates an interest of the user to at least a portion of the content data and communication means for transferring the personality data to the site/server subsystem.

The advantage of the invention is that it provides a convenient way to combine the information handling capability of modern cameras with image recording so that information relevant to a user's interests about a photographed item can be easily requested and accessed. In particular, it allows a visitor to customize the information available for downloading at an amusement site to a specific set of interests, and to combine that information with the specific pictures that the visitor has captured. The result is a unique product that relates the experience of visiting an amusement park or the like to an individual set of interests.

These and other aspects, objects, features and advantages of the present invention will be more clearly understood and appreciated from a review of the following detailed description of the preferred embodiments and appended claims, and by reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a first embodiment of a photographic and data transmission system according to the invention.

FIG. 2 is a block diagram of a second embodiment of a photographic and data transmission system according to the invention.

5 FIG. 3 is a block diagram of a film camera that can be used in the systems shown in Figures 1 and 2.

FIG. 4 is a flow diagram of the operation and downstream data processing of the photographic and data transmission system of Fig. 1 as used in connection with a digital camera.

10 FIG. 5 is a flow diagram of the operation and downstream data processing of the photographic and data transmission system of Fig. 2 as used in connection with a digital camera.

FIG. 6 is a flow diagram of the operation and downstream data processing of the systems shown in Figs. 1 and 2 as used in connection with a film camera.

15 FIG. 7 is a diagram of an exemplary data structure useful with the photographic and data transmission systems shown in Figs. 1 and 2.

DETAILED DESCRIPTION OF THE INVENTION

20 Because imaging devices employing film or electronic sensors are well known, as are networked communication systems, the present description will be directed in particular to elements forming part of, or cooperating more directly with, apparatus in accordance with the present invention. Elements not specifically shown or described herein may be selected from those known in the art. Certain aspects of the embodiments to be described may be provided in software. Given the system description as described in the following materials, all such software implementation is conventional and within the ordinary skill in such arts.

Beginning with Figure 1, a first embodiment of the photographic and data transmission system is shown to include two main parts, or subsystems. The first part of Figure 1 is a wireless communication component located at an attraction site 10, also referred to herein as an "image spot". An image spot is a specific location where a picture is likely to be taken, and additionally where a computer and a wireless communication system may be located. Such spots
30 would include user accessible viewing points within theme parks, amusement parks, sporting sites, National Park system sites, and the like. The image spot 10 in this embodiment is a stand-alone unit which includes a content database 12 for storing digital data, controlled with a personal computer 14 which contains a

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memory unit 16. A wireless communication subsystem includes a wireless transceiver 18 interchanging signals with an antenna 20 and a telecommunications processor 22. As a feature of the invention, the content database 12 contains a variety of information about the feature that qualifies as an image spot, and specifically information that would be of interest to a variety of viewers. Given its transmission capability, the image spot 10 functions as a "communicating scene" specifically by transmitting scene information of interest to a particular user.

The second part, or subsystem, of the photographic and data transmission system is a camera 24. Preferably, the camera is either a digital camera 24 as shown in Figure 1 (such as a Kodak DC120™ digital camera) or an Advantix™ film camera 26 as shown in Figure 3 (such as a Kodak Advantix™ 3700 camera). As shown in Figures 1 and 3, both types of cameras capture an image of an object through a lens section 28, and include a transceiver section 30 for communicating with the image spot 10. Both include a user interface 31 for communicating user commands to the camera, such as the desire to capture an image, and some type of processing modality, such as a microprocessor 42 or a logic control unit 38. As shown in more detail in Figure 3, the transceiver section 30 may include an infrared emitter 32 and an infrared detector 34 connected through a conventional IrDA interface 36 to the logic control unit 38. The transceiver section 30 in the digital camera 24 may also include an IR emitter-detector system as shown in Figure 3; alternatively, both cameras may include other types of transceivers, such as a radio-frequency (RF) transceiver system. For the digital camera shown in Figure 1, the transceiver signal is intercommunicated between a telecommunications processor 40 and the microprocessor 42.

Referring to Figure 1, an image is focused by the lens section 28 upon a charge coupled device (CCD) image sensor 44, which generates an image signal from the captured image. The image signal is converted into a digital signal by an A/D converter 46, processed by the microprocessor 42 and stored in a memory 48. The memory 48 may take any number of conventional forms, including a removable memory such as a memory card or a small hard drive card. The image signal, as well as content data related to the image, may be viewed on a liquid crystal display (LCD) 50. As a further feature of the invention, personality data descriptive of the user is stored in a personality file 52. As will be explained, the personality data relates one or more interests of the user to at least a portion of the content data in the content database 12 at the image spot 10. The personality data is transferred through the transceiver section 30 to the image spot 10, and

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integrates with the content data base 12 to determine the desired content for the particular captured image.

In the case of the film camera 26 shown in Figure 3, the lens section 28 forms an image upon a photosensitive film 54. The film 54 preferably is an Advantix™ film including a magnetic portion 56 which can store the personality data, as well as additional data received by the transceiver section 30. Recording on the magnetic portion 56 is coordinated with a motion control interface 58 such that recording occurs when the film 54 is in motion, e.g., during film advance between exposures.

When the digital camera 24 or the film camera 26 is brought into the communicating range of the image spot 10, and a photograph is taken at that spot, an exchange takes place between the camera and the image spot 10 via a wireless link 60. More specifically, the camera 24 or 26 communicates the personality data in the personality file 52 to the image spot 10. The purpose of the personality file 52 is to indicate to the image spot 10 the type of data that the user is interested in. Such data could be information such as graphics, photographs, video/audio clips or reference material associated with the particular attraction site, e.g., a site at a theme park. The relevant information, which may be the actual content information or a pointer or like descriptor indicative of the content, is then communicated by the image spot 10 to the camera 24 or 26 via the wireless link 60 and, if the camera has the capability, may be viewed by the user on the LCD screen 50 (e.g., available on the digital camera 24). Besides actual content information, the viewed information could be a list indicative of the content. If the user wants to save the data, acceptance is signaled through the user interface 31 and the data is stored in the memory in the camera. In the digital camera 24 the data is stored in the memory 48 along with the digital image, and in the film camera 26 the data is stored on the magnetic strip 56 along with a latent image on the film 54. Alternatively, a URL address for the data can be stored in the respective memory and the data may be downloaded via the internet at a later time. Besides indications of personal preference, the personality file 52 can also include account and transaction information, which will pay for the material subject to sale, such as copyrighted material.

For both types of cameras, the captured image is stored in an image recording memory (the memory 48 in the digital camera 24 or the magnetic region

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transmissions and applies the decoded transmissions to the microprocessor 76. The wireless link 74a is mainly intended to transfer content data and personality data between the image spot 10 and the image server 70. The wireless link 74b serves as a conduit for transfer of image data between the camera 24 and the image server 70. The content data is preferably stored in a content database 86 in the image server 70, although some, or all, content data may be stored at the image spot 10 in its content database 12 (which is shown in broken line in Figure 2 to indicate that its presence is optional). The image server 70 also includes a printer 88 for producing photographic images 90. In addition, the microprocessor 76 drives a writer 91 to provide customized media 92, such as compact disks (CDs), digital video disks (DVDs), or the like; an E-mail interface 93 to generate E-mail messages; and a custom album processor 94 to generate customized album prints 95.

The personality file of each user is input to the image server 70 at a registration site 97, such as an entrance booth at a theme park, where each user can directly interact with the image server 70 through an interactive data terminal 98, e.g., by entering biographical detail and responding to predetermined prompts based on typical visitor interests. This could also be done ahead of time via, e.g., e-mail or with the advance purchase of tickets. Then, in the interactive network shown in Figure 2, a plurality of registered users will capture their images at the various attraction sites, view the extra content requests sent to them from the image spot database 12 (as in Figure 1) or the content database 86 in the image server 70, and order a set of services such as albuming or prints from the image server 70. The image server 70 keeps track of all of the data and services requested during each user's visit to the park via the wired or wireless communication link with the image spot 10. At the end of the visit, the users can decide what services or content they want to order, and order those services and specify their method of delivery (e.g. via mail or e-mail). Orders could be placed upon leaving the theme park, e.g., at the registration site 97 or from a local hotel room or via the internet. The image server 70 may also receive the captured digital images via the same wireless link 74b from each user's digital camera 24 and combine these images with the requested content from the content databases 12 or 86. In cases where the image server 70 is out of the wireless range to the camera represented by the wireless link 74b, all the communication, including images, may be routed through the wired telecommunication link 74a between the image spot 10 and the image server 70.

An important aspect of the invention is the provision of a customized personality file, which is either stored in the camera according to the

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embodiments shown in Figures 1 and 2, or optionally stored in the image server 70 in a personality file memory 96 (together with a user ID in the camera) according to a variation shown in connection with Figure 2. The information stored in the personality file is used by the respective processors 76, 14 in the image server 70 and the image spot 10 to choose content data as the user visits respective image spots and capture images; in the case of the networked system shown in Figure 2, the personality file is also used to later combine the chosen content data with the user's own images. The personality file contains a collection of information designed to inform an image spot about a visitor's particular interests, and may include the following:

names of family members
names of other important individuals
addresses, phone numbers, E-mail addresses
ages (birth dates) of people in the file
educational backgrounds
specific interests - historical, natural, artistic, etc.
CPU at home/office
computer capability of named individuals
internet/on-line capability(including E-mail)
purpose of the current visit
interest in movie snippets
interest in sound bites
and so on...

Interests can be derived from a variety of factors associated with the personality file. Besides a specific recitation of interests, the relative ages of the visitors can bias the content toward small children, adolescents, or adults. Content can automatically be tailored to those with home internet connections by, e.g., providing URL addresses. Educational backgrounds, e.g., elementary vs. graduate school or technical vs. artistic, can be used to sort and assign content - e.g., a technical presentation of the creation of a site vs. an artistic presentation of the architecture of the site. Movie clips and sound bites can be added depending on the wishes of the visitor. The aforementioned information is not intended to be exhaustive and many other types and usages of personality information would come to mind and are intended to be within the scope of this invention.

As also shown in Figure 2, the personality file may be generated at some early stage in the visit to an attraction (such as at the registration site 97)

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and stored in a personality file memory 96 in the image server 70. In this scenario, the personality file 52 in the camera 24 or 26 would merely store a personal identifier that uniquely relates the camera 24 or 26 to the particular personality file 96 in the file server 70. This personal identifier would then be exchanged with the image spot 10 in order to access the pertinent parts of the content data base 86 in the image server 70.

The content databases in the image spot 10 and the image server 70 contain large collections of information that would satisfy the interests of a large number of users with different interests. Such content information may include the following:

- collections of images
- collections of sounds
- collections of movies
- multimedia content
- reference information - historical, natural
- URLs for further related information
- cost information
- and so on...

The collections of images, sounds, and movies may be further subdivided into more specific collections directed toward groups, e.g., children, adolescents, and adults, or to subject matter, e.g., technical, artistic, natural, literary, architectural, personal preferences (e.g., sports, cars, recipes) and so on. Multimedia content may be provided according to the above subdivisions, e.g., textual material suitable for different age groups or for outlining different subject matter. The aforementioned content information is not intended to be exhaustive and many other types and usages of content information would come to mind and are intended to be within the scope of this invention. Other conventionally available information, such as date, time and global positioning (GPS) data, may also be provided by the camera independently of the personality files.

If a user's personality file is registered and stored at a central location, such as the registration site 97, then a file structure may be established at the registration site 97 (in combination with the user interface 98) in which part of the personality file is a unique identification number (UID) for the camera. An example of such a structure is shown in Figure 7, which shows the structure for a film or digital camera file header. In either case, the file includes an image data region 200 and an image header 202. In the image header 202, a unique ID field

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204 assigns a unique entity to each camera by using a large number for the ID. A Camera/media ID field 206 represents the model, S/N, etc. for the camera and the film (if a film camera is used). The camera/media ID field 206 can be used to indicate what the camera system is capable of doing, e.g., whether the camera has an image review capability, such as the LCD 50. A vendor ID field 208 is a number that is used to represent a vendor (camera manufacturer) such as Eastman Kodak Company, and allows the unique ID field 204 and Camera ID field 206 to be unique to and assignable by the specific vendor (otherwise vendors would have to coordinate unique numbers). It can also be used to recognize special processing needs for the vendor.

If the camera is to store content data, a content reference field 210 may be used to reference to at least some of the chosen content data, such as multimedia data, that is stored in the server 70(e.g., sound #34356 or image #32349), so that large data files do not have to be stored in the camera. It can also be an address pointing to the data in the content data base 86 in the server 70, similar to a URL address, or it can be an actual URL address. A site ID field 212 refers to the owner of the content. If images in one camera were taken, e.g., to different theme parks, the site's ID reference number would make the content reference unique to each park. A services requested ID field 214 would reference, by image, special services such as albums, enlargements of the reviewed images or content. While Figure 7 suggests one file structure, the actual presence of data will depend on system capabilities and the type of camera used in the system.

In operation with a stand alone image spot and a digital camera, as shown in Figure 4, a photograph is taken at the image spot 10 using the digital camera 24 (step 100). The communication between the image spot 10 and the camera 24 using the data stored in the personality file 52 will determine what extra data is going to be used in the extra services requested by the user (step 102). This content can be uploaded to the camera 24 and selected using the preview function of the camera's LCD screen 50 (step 104). After the data is chosen (step 106), it is uploaded to the camera 24 using the wireless link (step 108). Alternatively, a reference address to the chosen content can be stored in a file header in the camera 24. In addition, a digital camera user could elect to download the URL address of the chosen content data (step 112) for subsequent retrieval (step 114) or to download the user e-mail address to the image spot 10 (step 116), and the extra data chosen is then sent to the users e-mail account (step 118).

In operation with a digital camera in a networked system as shown in Figure 5, the photograph is taken at the image spot 10 using a digital camera

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(step 160). The communication between the image spot 10, the camera 24, and the image server 70 using the data stored in the personality file will determine what extra data is to be used in performing the extra services requested (step 162). This extra data or content may be reviewed on the LCD display on the camera (step 164), and the user chooses the desired data (step 166). The image data for the captured images are sent to the image server 70 (step 168), and the information header of these digital files are then sent to the camera where they are stored in memory (step 170). The request for this data is then transmitted to the image server 70 at a central location (step 172) via a communication link (wired or wireless). At the central location, the images and other content are combined to create the albums and multimedia files as desired, including custom CDs, DVDs (digital versatile disk) or E-mail.

In operation with a film camera 26, as shown in Figure 6, an user's personality file is registered and stored at a central location, such as the image server 70 (step 130). Part of this personality file is a unique identification number (UID) for the camera as shown in Figure 7. The images are taken using the film camera 26 at the image spots 10 around, e.g., the theme park (step 132). The communication between the image spot 10, the camera 26, and the image server 70 using the data stored in the personality file 52 will determine what extra data is going to be used in the extra services requested by the user (step 134). The extra information (or pointers to the information in the image server's database 86) is chosen at these image spots 10 and transmitted via the IrDA wireless link to the camera (step 136). The information or the location of this extra data (in the image server's database 86) is stored on the magnetic portion 56 of the film 54 (step 138). The film is then dropped off (step 140) at a processing center, where the film is processed and the extra services such as albuming and multimedia file creation are performed using the information saved on the magnetic coating of the film (step 144). If the information saved on the film is the location of the data, that data is downloaded after a telecommunication link (step 142) is established between the image server 70 and the processing center. If the processing center is the image server center (step 150), the information is on site, and there is no need for a telecommunication link. In either case, the user reviews the product, which can be done on-line (step 146).

The invention has been described with reference to a preferred embodiment. However, it will be appreciated that variations and modifications can be effected by a person of ordinary skill in the art without departing from the scope of the invention.

PARTS LIST

10	image spot
12	content database
14	personal computer
16	memory unit
18	wireless transceiver
20	antenna
22	telecommunication processor
24	digital camera
26	film camera
28	lens section
30	transceiver section
31	user interface
32	infrared emitter
34	infrared detector
36	IrDA interface
38	logic control unit
40	telecommunications processor
42	microprocessor
44	CCD
46	A/D converter
48	memory
50	LCD
52	personality file
54	film
56	magnetic portion
58	motion control interface
60	wireless link
70	image server
72	wired link
74a	wireless link
74b	wireless link
76	microprocessor 76
78	interface
80	transceiver
82	antenna
84	communications processor

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86	content data base
88	printer
90	prints
91	CD writer
92	CDs, DVDs
93	E-mail interface
94	custom album processor
95	custom albums
96	personality file memory
100-118	steps
130-146	steps
160-174	steps
200	image data region
202	image header
204	ID field
206	camera/media ID field
208	vendor ID field
210	content reference field
212	site ID field
214	services requested ID field

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